

## § 25.200

conditions set forth in the authorization. Temporary operation may be extended beyond the termination date only upon application to the Commission.

### Subpart C—Technical Standards

SOURCE: 30 FR 7176, May 28, 1965, as amended at 36 FR 2562, Feb. 6, 1971, unless otherwise noted.

#### § 25.200 Interim equipment authorization.

(a) For purposes of this section, a “GMPCS system” is defined as “any satellite system, (i.e., fixed or mobile, broadband or narrow-band, global or regional, geostationary or non-geostationary, existing or planned) providing telecommunication services directly to end users from a constellation of satellites.”

(b) Subsequent to receiving a blanket authorization under this part, terminals used in conjunction with GMPCS systems, as defined under § 25.200 (a) of this part, may also obtain an equipment authorization from the Commission in accordance with the certification procedure for use under this part. The certification procedure is found in part 2, subpart J of this chapter.

(c) In order to be granted certification, a transmitter shall comply with the technical specifications in this part. In addition, mobile earth satellite terminals for use in the band of 1610–1626.5 MHz shall meet a specific out-of-band emissions limit. Emissions in the band 1559–1605 MHz shall be limited to –70 dBW/MHz averaged over any 20 millisecond period for wideband signals, and a standard of –80 dBW across within the measurement bandwidth of 700 Hz or less for narrowband signals.

(d) Licensees and manufacturers are subject to the radiofrequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of mobile or portable devices operating under this section shall contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Tech-

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nical information showing the basis for this statement shall be submitted to the Commission upon request.

(e) Equipment authorizations issued pursuant to this section will be conditioned on the equipment meeting all relevant technical requirements that are adopted by the Commission in implementing the GMPCS Arrangements.

[64 FR 4997, Feb. 2, 1999]

#### § 25.201 Definitions.

*Active satellite.* An earth satellite carrying a station intended to transmit or re-transmit radiocommunication signals.

*Base Earth Station.* An earth station in the fixed-satellite service or, in some cases, in the land mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the land mobile-satellite service. (RR)

*Coordination distance.* For the purposes of this part, the expression “coordination distance” means the distance from an earth station, within which there is a possibility of the use of a given transmitting frequency at this earth station causing harmful interference to stations in the fixed or mobile service, sharing the same band, or of the use of a given frequency for reception at this earth station receiving harmful interference from such stations in the fixed or mobile service.

*Earth station.* A station located either on the Earth’s surface or within the major portion of the Earth’s atmosphere intended for communication:

(a) With one or more space stations; or

(b) With one or more stations of the same kind by means of one or more reflecting satellites or other objects in space.

*Equivalent power flux-density.* The equivalent power flux-density (EPFD) is the sum of the power flux-densities produced at a geostationary satellite orbit (GSO) receive earth or space station on the Earth’s surface or in the geostationary satellite orbit, as appropriate, by all the transmit stations within a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system, taking into account the off-axis discrimination of a reference

receiving antenna assumed to be pointing in its nominal direction. The equivalent power flux-density, in dB(W/m<sup>2</sup>)

in the reference bandwidth, is calculated using the following formula:

$$\text{EPFD} = 10 \cdot \log_{10} \left[ \sum_{i=1}^{N_a} 10^{\frac{P_i}{10}} \cdot \frac{G_t(\theta_i)}{4 \cdot \pi d_i^2} \cdot \frac{G_r(\phi_i)}{G_{r,\max}} \right]$$

Where:

$N_a$  is the number of transmit stations in the non-geostationary satellite orbit system that are visible from the GSO receive station considered on the Earth's surface or in the geostationary satellite orbit, as appropriate;

$i$  is the index of the transmit station considered in the non-geostationary satellite orbit system;

$P_i$  is the RF power at the input of the antenna of the transmit station, considered in the non-geostationary satellite orbit system in dBW in the reference bandwidth;

$2_i$  is the off-axis angle between the boresight of the transmit station considered in the non-geostationary satellite orbit system and the direction of the GSO receive station;

$G_t(2_i)$  is the transmit antenna gain (as a ratio) of the station considered in the non-geostationary satellite orbit system in the direction of the GSO receive station;

$d_i$  is the distance in meters between the transmit station considered in the non-geostationary satellite orbit system and the GSO receive station;

$N_r$  is the off-axis angle between the boresight of the antenna of the GSO receive station and the direction of the  $i$ th transmit station considered in the non-geostationary satellite orbit system;

$G_r(N_r)$  is the receive antenna gain (as a ratio) of the GSO receive station in the direction of the  $i$ th transmit station considered in the non-geostationary satellite orbit system;

$G_{r,\max}$  is the maximum gain (as a ratio) of the antenna of the GSO receive station;

**Fixed earth station.** An earth station intended to be used at a specified fixed point.

**Fixed-Satellite Service.** A radiocommunication service between earth stations at given positions, when one or more satellites are used; the given position may be a specified fixed point or any fixed point within specified areas; in some cases this service includes satellite-to-satellite links, which may also be operated in the

inter-satellite service; the fixed-satellite service may also include feeder links of other space radiocommunication services. (RR)

**Geostationary satellite.** A geosynchronous satellite whose circular and direct orbit lies in the plane of the Earth's equator and which thus remains fixed relative to the Earth; by extension, a satellite which remains approximately fixed relative to the Earth.

**2 GHz Mobile-Satellite Service.** A mobile-satellite service that operates in the 1990–2025 MHz and 2165–2200 MHz frequency bands, or in any portion thereof.

**Inter-Satellite Service.** A radiocommunication service providing links between artificial earth satellites.

**Land Earth Station.** An earth station in the fixed-satellite service or, in some cases, in the mobile-satellite service, located at a specified fixed point or within a specified area on land to provide a feeder link for the mobile-satellite service. (RR)

**Land Mobile Earth Station.** A mobile earth station in the land mobile-satellite service capable of surface movement within the geographical limits of a country or continent. (RR)

**Mobile earth station.** An earth station intended to be used while in motion or during halts at unspecified points.

**Mobile-Satellite Service.** A radiocommunication service:

(1) Between mobile earth stations and one or more space stations, or between space stations used by this service; or

(2) Between mobile earth stations, by means of one or more space stations.

This service may also include feeder links necessary for its operation. (RR)

*NGSO FSS gateway earth station.* A gateway earth station is an earth station complex consisting of multiple interconnecting earth station antennas supporting the communication routing and switching functions of a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system as a whole. A gateway earth station in the NGSO FSS:

(1) Does not originate or terminate radiocommunication traffic, but interconnects multiple non-collocated user earth stations operating in frequency bands other than designated gateway bands, through a satellite with other primary terrestrial networks, such as the public switched telephone network (PSTN) and/or Internet networks.

(2) Is prohibited from connecting directly with a private communication network.

(3) May also be used for telemetry, tracking, and command transmissions for the same NGSO FSS system.

(4) May include multiple antennas, each required to meet the antenna performance standard in § 25.209(h), located within an area of one second latitude by one second longitude.

(5) Is considered as a separate gateway earth station complex if it is outside of the area of one second latitude by one second longitude of paragraph (4) of this definition, for the purposes of coordination with terrestrial services.

*Non-Voice, Non-Geostationary Mobile-Satellite Service.* A mobile-satellite service reserved for use by non-geostationary satellites in the provision of non-voice communications which may include satellite links between land earth stations at fixed locations.

*1.6/2.4 GHz Mobile-Satellite Service.* A mobile-satellite service that operates in the 1610–1626.5 MHz and 2483.5–2500 MHz frequency bands, or in any portion thereof.

*Passive satellite.* An earth satellite intended to transmit radio communication signals by reflection.

*Protection areas.* The geographic regions on the surface of the Earth where United States Department of Defense (“DoD”) meteorological satellite systems or National Oceanic and Atmospheric Administration (“NOAA”) meteorological satellite systems, or both

such systems, are receiving signals from low earth orbiting satellites.

*Radiodetermination-Satellite Service.* A radiocommunication service for the purpose of radiodetermination involving the use of one or more space stations. This service may also include feeder links necessary for its own operation. (RR)

*Satellite Digital Audio Radio Service (“DARS”).* A radiocommunication service in which audio programming is digitally transmitted by one or more space stations directly to fixed, mobile, and/or portable stations, and which may involve complementary repeating terrestrial transmitters, telemetry, tracking and control facilities.

*Satellite system.* A space system using one or more artificial earth satellites.

*Spacecraft.* A man-made vehicle which is intended to go beyond the major portion of the Earth’s atmosphere.

*Space operation service.* A radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry and space telecommand. These functions will normally be provided within the service in which the space station is operating.

*Space radiocommunication.* Any radiocommunication involving the use of one or more space stations or the use of one or more reflecting satellites or other objects in space.

*Space station.* A station located on an object which is beyond, is intended to go beyond, or has been beyond, the major portion of the Earth’s atmosphere.

*Space system.* Any group of cooperating earth stations and/or space stations employing space radiocommunication for specific purposes.

*Space telecommand.* The use of radiocommunication for the transmission of signals to a space station to initiate, modify or terminate function of the equipment on a space object, including the space station.

*Space telemetering.* The use of telemetering for the transmission from a space station of results of measurements made in a spacecraft, including those relating to the functioning of the spacecraft.

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*Space tracking.* Determination of the orbit, velocity or instantaneous position of an object in space by means of radiodetermination, excluding primary radar, for the purpose of following the movement of the object.

*Terrestrial radiocommunication.* Any radiocommunication other than space radiocommunication or radio astronomy.

*Terrestrial station.* A station effecting terrestrial radiocommunication.

[30 FR 7176, May 28, 1965, as amended at 36 FR 2562, Feb. 6, 1971; 48 FR 40254, Sept. 6, 1983; 51 FR 18445, May 20, 1986; 54 FR 49993, Dec. 4, 1989; 56 FR 42706, Aug. 29, 1991; 58 FR 68059, Dec. 23, 1993; 59 FR 53329, Oct. 21, 1994; 62 FR 11105, Mar. 11, 1997; 62 FR 59296, Nov. 3, 1997; 65 FR 59143, Oct. 4, 2000; 66 FR 10621, Feb. 16, 2001]

### § 25.202 Frequencies, frequency tolerance and emission limitations.

(a)(1) *Frequency band.* The following frequencies are available for use by the fixed-satellite service. Precise frequencies and bandwidths of emission shall be assigned on a case-by-case basis. The Table follows:

Space-to-Earth (GHz)	Earth-to-Space (GHz)
3.7–4.2 <sup>1</sup>	5.925–6.425 <sup>1</sup>
10.7–10.95 <sup>1 12</sup>	12.75–13.15 <sup>1 12</sup>
10.95–11.2 <sup>1 12 12</sup>	13.2125–13.25 <sup>1 12</sup>
11.2–11.45 <sup>1 12</sup>	13.75–14 <sup>4 12</sup>
11.45–11.7 <sup>1 12 12</sup>	14–14.2 <sup>5</sup>
11.7–12.2 <sup>3</sup>	14.2–14.5
12.2–12.7 <sup>13</sup>	13 17.3–17.8 <sup>9</sup>
18.3–18.58 <sup>1 10</sup>	27.5–29.5 <sup>1</sup>
18.58–18.8 <sup>6 10 11</sup>	29.5–30
18.8–19.3 <sup>7 10</sup>	48.2–50.2
19.3–19.7 <sup>8 10</sup>	
19.7–20.2 <sup>10</sup>	
37.6–38.6	
40–41	

<sup>1</sup>This band is shared coequally with terrestrial radiocommunication services.

<sup>2</sup>Use of this band by geostationary satellite orbit satellite systems in the fixed-satellite service is limited to international systems; i.e., other than domestic systems.

<sup>3</sup>Fixed-satellite transponders may be used additionally for transmissions in the broadcasting-satellite service.

<sup>4</sup>This band is shared on an equal basis with the Government radiolocation service and grandfathered space stations in the Tracking and Data Relay Satellite System.

<sup>5</sup>In this band, stations in the radionavigation service shall operate on a secondary basis to the fixed-satellite service.

<sup>6</sup>The band 18.58–18.8 GHz is shared co-equally with existing terrestrial radiocommunication systems until June 8, 2010.

<sup>7</sup>The band 18.8–19.3 GHz is shared co-equally with terrestrial radiocommunication services, until June 8, 2010. After this date, the sub-band 19.26–19.3 GHz is shared co-equally with existing terrestrial radiocommunication systems.

<sup>8</sup>The use of the band 19.3–19.7 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links for the mobile-satellite service.

<sup>9</sup>The use of the band 17.3–17.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for broadcasting-satellite service, and the sub-band 17.7–17.8 GHz is shared co-equally with terrestrial fixed services.

<sup>10</sup>This band is shared co-equally with the Federal Government fixed-satellite service.

<sup>11</sup>The band 18.6–18.8 GHz is shared co-equally with the non-Federal Government and Federal Government Earth exploration-satellite (passive) and space research (passive) services.

<sup>12</sup>Use of this band by non-geostationary satellite orbit systems in the fixed-satellite service is limited to gateway earth station operations.

<sup>13</sup>Use of this band by the fixed-satellite service is limited to non-geostationary satellite orbit systems.

(2) The following frequencies are available for use by the Radio-determination Satellite Service:

1610–1626.5 MHz: User-to-Satellite Link  
2483.5–2500 MHz: Satellite-to-User Link

Fixed-Satellite service frequencies may be used for links between radio-determination satellites and control centers, including the following designated bands, subject to the Rules in this subpart:

5150–5216 MHz: Satellite-to-Control Center Link  
6525–6541.5 MHz: Control Center-to-Satellite Link

(3) The following frequencies are available for use by the non-voice, non-geostationary mobile-satellite service:

137–138 MHz: space-to-Earth  
148–149.9 MHz: Earth-to-space  
149.9–150.05 MHz: Earth-to-space  
399.9–400.05 MHz: Earth-to-space  
400.15–401 MHz: space-to-Earth

Until January 1, 1997, the allocations in the 149.9–150.05 MHz and 399.9–400.05 MHz bands may be used on a secondary basis only. Since the 399.9–400.05 MHz band is not allocated internationally to the mobile-satellite service, all operations outside the United States will be on a non-interference basis only.

(4)(i) The following frequencies are available for use by the 1.6/2.4 GHz Mobile-Satellite Service:

1610–1626.5 MHz: User-to-Satellite Link  
1613.8–1626.5 MHz: Satellite-to-User Link (secondary)  
2483.5–2500 MHz: Satellite-to-User Link

(ii) The following frequencies are available for use by the 2 GHz Mobile-Satellite Service:

1990–2025 MHz: User-to-Satellite Link  
2165–2200 MHz: Satellite-to-User Link

(5) The following frequencies are available for use by the inter-satellite service:

22.55–23.00 GHz  
23.00–23.55 GHz  
24.45–24.65 GHz  
24.65–24.75 GHz